

**WHAT IS CLAIMED IS:**

✓ A rubber powder, containing one or more oxidic or siliceous fillers, comprising at least one member selected from the group consisting of synthetic fillers in an amount of > 250 phr to 5000 phr, naturally occurring fillers in an amount of > 350 phr to 5000 phr and carbon black in an amount of > 250 phr to 5000 phr, wherein the total amount of filler does not exceed 5000 phr; and wherein the surface of said oxidic or siliceous fillers is modified with one or more organosilicon compounds of the general formulae



or



in which

15  $B^1$ : represents -SCN, -SH, -Cl, NH<sub>2</sub> (when q = 1) or -S<sub>x</sub>- (when q = 2)

20 R and  $R^1$ : represent an alkyl group with 1 to 4 carbon atoms, branched or unbranched, or a phenyl group, wherein all the groups R and  $R^1$  may be identical or different and preferably represent an alkyl group

R: may also represent a C<sub>1</sub>-C<sub>4</sub>-alkyl or C<sub>1</sub>-C<sub>4</sub>-alkoxy group, branched or unbranched,

n: is 0, 1 or 2,

25 Alk: represents a divalent straight or branched hydrocarbon group with 1 to 6 carbon atoms,

m: is 0 or 1

*SK*  
*A1*  
*CM*

Ar: represents an arylene group with 6 to 12 carbon atoms

p: is 0 or 1, with the proviso that p, m and n are not simultaneously 0,

x: is a number from 2 to 8,

Alkyl: represents a monovalent straight or branched saturated hydrocarbon group with 1 to 20 carbon atoms, preferably 2 to 8 carbon atoms,

Alkenyl: represents a monovalent straight or branched unsaturated hydrocarbon group with 2 to 20 carbon atoms, preferably 2 to 8 carbon atoms,

10

- Sub B1*
2. A rubber powder according to claim 1, coated with a layer of polystyrene, polystyrene/butadiene copolymers, polyethylenes or polypropylenes.
- 15 3. A rubber powder according to claim 1, containing one or more processing or vulcanizing aids selected from the group consisting of zinc oxide, zinc stearate, stearic acid, polyalcohols, polyamines, plasticizer, anti-aging agents, reinforcing resins, flame retardant and sulfur.
- 20 4. A rubber powder according to claim 3, wherein the flame retardant comprises  $\text{Al(OH)}_3$  or  $\text{Mg(OH)}_2$ .
- 25 5. A rubber powder according to claim 1, which has a particle size range from 25  $\mu\text{m}$  to 3000  $\mu\text{m}$  or, in granulated form, from 2 to 10 mm.
- SK*  
*A2*

6. A process for preparing finely divided rubber powders by precipitation from water-containing mixtures which contain fillers, the water-containing mixture being in a form selected from the group consisting of suspensions, aqueous emulsions of a rubber or polymer rubber and rubber solutions, by adding water-soluble salts of a metal selected from the group consisting of Groups IIa, IIb, IIIa and VIII of the Periodic System of Elements, comprising:
- 5
- a) preparing a filler suspension with a suspension density between 0.5 and 10 %, with respect to the solids, from at least one member selected from the group consisting of a siliceous compound and carbon black by stirring, the solids particles optionally having been previously milled down or deagglomerated using a mill; optionally adding hydrogen bridge-forming compounds to the suspension in amounts of 0.5 to 10 parts, with respect to 100 parts of filler, and 10
- 15
- optionally heating the suspension to within the range from 25° to 95°C,
- b) if the suspension contains siliceous fillers, dissolving in water one or more organosilicon compounds in accordance with the formulae (I) to (III) which contain at least one alkoxy group, optionally emulsifying directly or in water in the presence of a surface active substance; and mixing with the aqueous suspension of filler or with its mixture with a carbon black at a temperature of 10° to 60°C, with stirring,
- 20
- c) mixing this suspension with the polymer latex, polymer emulsion or polymer solution, reducing pH of this mixture with an acid or with an aqueous solution of one of said water-soluble salts, to a pH value between 4 and 7 and precipitating the rubber in the mixture together with the fillers optionally modified by the organosilicon compounds,
- 25
- d) separating the precipitated filler-containing rubber powder, and optionally washing until acid-free, and
- e) drying the obtained filler and optionally granulating the filler.
- 30

- D00000000000000000000000000000000
7. A process according to claim 6, wherein, in step c), the pH value is reduced to between 4.5 and 5.5.
8. A process according to claim 6, wherein, following step c), aqueous plastics emulsions containing at least one member selected from the group consisting of polystyrene, polystyrene/butadiene copolymers, polyethylenes, polypropylenes and polyvinyl acetates are added to the reaction mixture in amounts of 0.5 to 10 phr.
9. A process according to Claim 6, wherein the filler concentration in the reaction mixture is adjusted to:
- >250 phr, when using synthetic silicas or the filter cakes produced during their preparation,
  - >350 phr, when using a natural siliceous filler, including a slurry produced during working up, or
  - >250 to 5000 phr, when using carbon blacks, alone or mixed with one or more of said fillers,
10. A process according to claim 6, wherein non-ionic, cationic or anionic surfactants are used as the surface active substances.
11. A process according to claim 6, wherein up to 5 parts by weight of an alkali silicate solution, with respect to 100 parts of rubber, is added to the suspension before the precipitating step.

12. A process according to claim 6, wherein precipitated silica is used in the form of filter cake obtained during preparation of said precipitated silica.
  13. A process according to claim 6, wherein the filler suspension in step (a) is prepared from siliceous fillers pre-modified with one or more organosilicon compounds in accordance with formulae (I), (II) or (III).
  14. A process according to claim 6, wherein one or more processing or vulcanizing aids are added to the suspension of the filler, optionally being mixed with the polymer rubber before the precipitation process of paragraph (c), wherein said aids comprise one or more members selected from the group consisting of zinc oxide, zinc stearate, stearic acid, polyalcohols, polyamines, plasticizer, anti-aging agents against heat or light, reinforcing resins, flame retardants and sulfur.
  15. A process for preparing vulcanizable rubber mixtures, comprising incorporating rubber powders according to claim 1 into a corresponding rubber as fillers optionally with the addition of processing and vulcanizing

26